

Amendments to the Specification:

Please replace paragraph [0005] with the following paragraph:

[0005] Electronic compasses have become increasingly popular as an accessory in automobiles. The general construction of a typical electronic compass circuit 10 is shown in Fig. 1. Specifically, a typical electronic compass circuit includes a magnetic sensor circuit 12, which includes a Y-axis sensor 13 and an X-axis sensor 14. Magnetic sensor circuit 12 is coupled to a processing circuit 15, which operates under control of software code to process the data supplied by sensor circuit 12, calibrate the compass circuit based upon such processing, and to determine the heading of the vehicle based upon the data provided by sensor circuit 12. Processing circuit 15 is coupled to a non-volatile memory 16, which stores calibration data so that the compass does not need to be recalibrated each ignition cycle. The ~~calculated~~ calibrated vehicle heading is sent from processing circuit 15 to a heading display 18 for display to the vehicle occupants. The heading display is typically incorporated in an overhead console or rearview mirror assembly. User input switches 20 may also be provided that enable a user to interact with processing circuit 15 so as to cause processing circuit 15 to change the information displayed on display 18, manually recalibrate, and/or enter the geographic zone in which the vehicle is currently traveling. Additionally, a power supply circuit 22 is provided for receiving the 12-volt power from the vehicle's battery or ignition, and converts the power to power levels useful for the various components of the compass circuit 10.

Please replace paragraph [0120] with the following paragraph:

[0120] To better illustrate the principles of the present invention, reference is now made to Fig. 8, which shows the coordinate system of the magnetic sensors of the compass as modified to account for offset of the true North Pole ~~from~~ from the magnetic north pole, and shifting of the sensor orientation relative to the vehicle. More specifically, a portion of the "world sphere" is depicted along with a coordinate plane labeled X_w , Y_w , Z_w in which the X_w coordinate axis is aligned with the vehicle's direction of travel and is generally horizontal (*i.e.*,

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tangent to the Earth's surface), the Z_w coordinate axis is vertical (*i.e.*, points to the center of the Earth), and the Y_w coordinate axis is horizontal and laterally disposed perpendicular to the vehicle's direction of travel.

Please replace paragraph [0189] with the following paragraph:

[0189] Once a sufficient number of points in the PointSet has been attained, the processing circuit proceeds to step 336 in which the AdjustBestFitPoint and AdjustBestFitRadius subroutines are called. Then, in step 338, the processing circuit calculates the difference between the current approximation center point (sc_{xs} , sc_{ys} , sc_{zs}) and the point currently stored in NVM 112. If the difference between these points exceeds the variable centerShiftLimit (step 340), which was set in step 296, the processing circuit sets the refitFlag to TRUE in step 342 prior to proceeding to execute step 300 in which the currently calculated approximation center point and radius are stored in NVM 112 in a manner so as to overwrite the previously stored approximation data. The process then proceeds to step 302 where the processing circuit enters the LEARN state. If, in step 340, the processing circuit determines that the difference between the approximation center point that was currently calculated and that which was previously stored in NVM 112 does not exceed the variable centerShiftLimit, the processing circuit advances to step 302 skipping steps 342 and 300. In step 302, the state is set to LEARN and the Heading subroutine is called in step 304. Following the Heading subroutine, the process returns to step 200 in the CompassFlowControl routine or a new rawMagPoint is attained and processed. Control then flows through step 322 where it is determined that the processing circuit is in the LEARN state. The processing circuit then proceeds to step 350 (Fig. 12C) where it determines whether the value noiseLevel is SILENT. If not, the Heading subroutine is called in step 352 where the vehicle heading would be updated if the noiseLevel is QUIET, otherwise the heading would not be updated and the routine would return to step 200 to process a new rawMagPoint and subsequent rawMagPoints until such time that noiseLevel is SILENT. Once noiseLevel is ~~silent~~ SILENT, the processing circuit executes step 354 in which it calls the UpdateAngleBucket subroutine 356, which is illustrated in Fig. 18.